

ELADOCAGENE EXUPARVOVEC GENE THERAPY IMPROVES MOTOR DEVELOPMENT IN PATIENTS WITH AROMATIC L-AMINO ACID DECARBOXYLASE DEFICIENCY

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Introduction: Aromatic L-amino acid decarboxylase (AADC) deficiency is caused by mutations in the DDC gene reducing AADC enzyme activity causing motor and neurodevelopmental impairments.

Objective: Evaluate clinical outcomes in children with AADC treated with Eladocagene exuparvec, recombinant adeno-associated viral vector serotype 2 carrying the coding sequence for AADC enzyme.

Methods: Therapy was infused bilaterally in the putamina of 30 patients aged 18–102 months receiving 1.8×10^{11} vg (n=21) or 2.4×10^{11} vg (n=9) followed for up to 120 months assessed using PDMS-2 key motor milestones including head control (partial or full), sitting (supported or independently), standing (with/away from support; up from cross-legged position), and walking (with/without assistance; 10 feet; taped line). Motor milestones were measured every 3 months for 1 year following gene therapy, then every 6–12 months for ≤ 120 months. Data extracted on January 4, 2022.

Results: At baseline, no patients had mastered head control or more advanced milestones. At year 1 of follow-up, patients were gaining the following skills (n): partial head control (26); full head control (15), sitting unassisted (7), supported standing (2). Progression of development was noted at years 5 and 10. By year 5 of follow-up, more advanced milestones were achieved (n): full head control (24), sitting unassisted (21) assisted walking (5), walking 10 feet (3), or walking upstairs (3). These abilities were maintained for as long as 10 years.

Conclusion: The data indicate that eladocagene exuparvec can provide a durable, positive impact on motor development in patients with AADC deficiency.

Keywords: Rare Diseases. Genetics. Movement Disorders (including Cerebral Palsy).